

HB-6
Gold Star Co., Ltd.

STEREO CASSETTE TAPE RECORDER With 4 BAND RADIO

TSR-590 (FM/SW/MW/LW)
TSR-595 (FM/SW₂/SW₁/MW)

SERVICE MANUAL

SPECIFICATIONS

RADIO SECTION

Circuit System	Superheterodyne
	Multiplex Stereo System
Antenna	FM/SW/SW2 Telescopic
	SW1/MW/LW Built-in
FM	Ferrite bar Antenna
Frequency Range.....	87.5-108MHz
Intermediate Frequency.....	10.7MHz
Sensitivity (max).....	10dB
Signal to Noise Ratio	45dB
Stereo Separation	30dB
SW/SW2/SW1/MW/LW	
Frequency Range	
SW	6-18MHz
SW2	6.8-22.5MHz
SW1	2.25-7.2MHz
MW	525-1605kHz
LW	150-350kHz
Intermediate Frequency	455kHz (OPTIONAL)
	465kHz
Sensitivity (max)	
SW	25dB
SW2	25dB
SW1	35dB
MW	35dB
LW	50dB
Signal to Noise Ratio	48dB

CASSETTE SECTION

Circuit System	4 Track Stereo, 2 Track
	Monaural
	AC Bias, AC Erase

Tape Speed 4.75 cm/sec

Wow & Flutter	below 0.15%
F.F & REW Time.....	95 sec (Using C-60 tape)
Frequency Response	
Playback	125Hz-8kHz
Recording/Playback	100Hz-6.3kHz (with Standard tape)
	100Hz-8kHz (with CrO ₂ tape)
Signal to Noise Ratio	More than 40dB
Track Cross Talk	More than 50dB
Recording Bias Frequency...	57kHz ± 3kHz
Channel Separation	More than 25dB

GENERAL

Power Output	8W (4W x 2) Maximum
	6.4W (3.2W x 2) Undistortion
Power Requirement	AC: Refer to the Back Label
	DC: 12V, Eight size "D" batteries
Semiconductor	4IC 8 Transistors 21 Diodes
Power Consumption	AC 18 W
Speakers.....	120mm(5")
	Impedance 4 ohm
Input Impedance	
MIC Jack (R/L)	500 ohm
LINE IN Jack (R/L).....	50 Kohm
Output Impedance	
HEADPHONE Jack	8 ohm
LINE OUT Jack	10 Kohm
Weight	3.5Kg (without Batteries)
Dimensions	420(W) x 240(H) x 115(D) mm

* This specifications may be changed for improvement of performance without notice.

CONTROLS

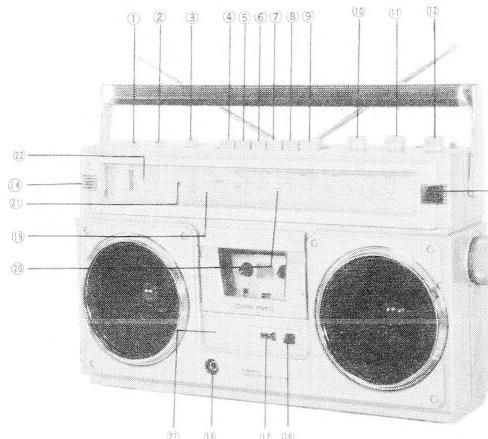


Fig. 1

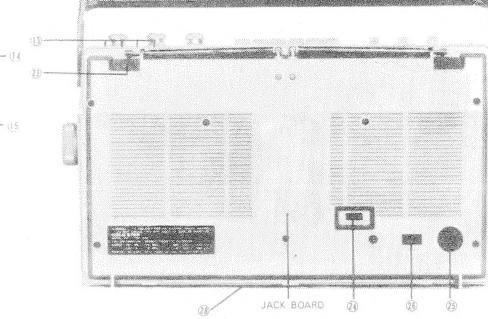


Fig. 2

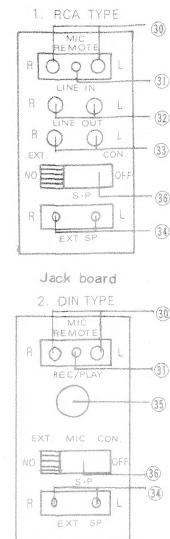


Fig. 3

* Notice that JACK BOARD is selected either DIN type or RCA type according to the region to be used.

1. TAPE SELECTOR Switch	19. DIAL Scale
2. STEREO/MONO Selector switch	20. DIAL Pointer
3. FUNCTION Selector switch	21. FM STEREO Indicator
4. PAUSE Button	22. BATTERY/TUNING/RECORDING Indicator
5. STOP/Eject Button	23. TELESCOPIC Antenna
6. PLAY Button	24. R.I.F. Switch
7. F.F/CUE Button	25. VOLTAGE SELECTOR Switch (Only in AC)
8. REWIND/REVIEW Button	26. 110/220(240)V)
9. RECORD Button	27. AC MAINS SOCKET
10. BALANCE Control Knob	28. Cassette Compartment Lid
11. TONE Control Knob	29. Battery Compartment Lid
12. VOLUME Control Knob	30. External Microphone Jack
13. Band Selector Button	31. Remote Control Jack
14. Built-in Condenser Microphone	32. LINE IN Jack
15. TUNING Knob	33. LINE OUT Jack
16. RESET Button	34. External speaker Jack
17. TAPE COUNTER	35. DIN Socket
18. HEADPHONE JACK	36. MICROPHONE Selector Switch

BLOCK DIAGRAM

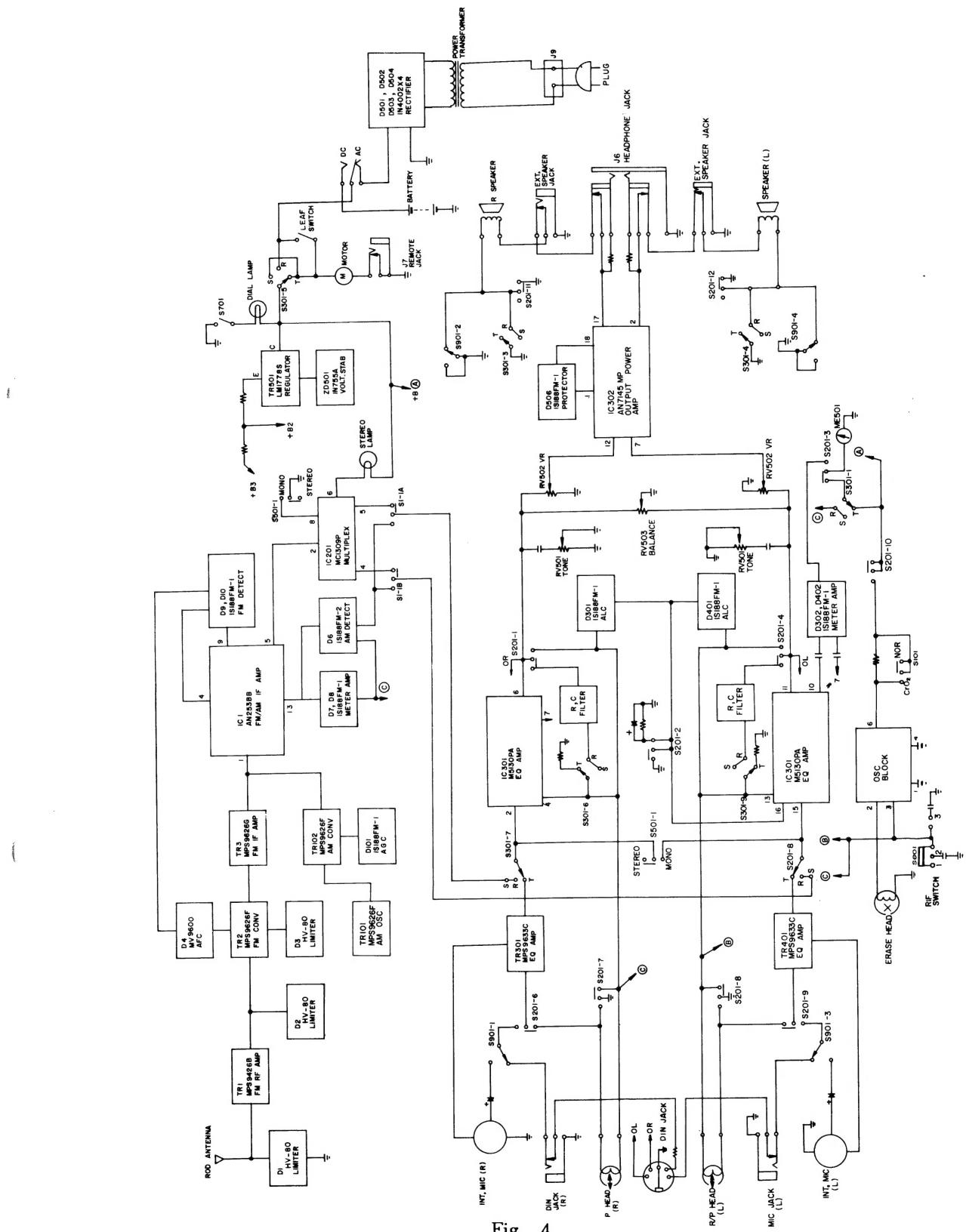


Fig.

DISASSEMBLY

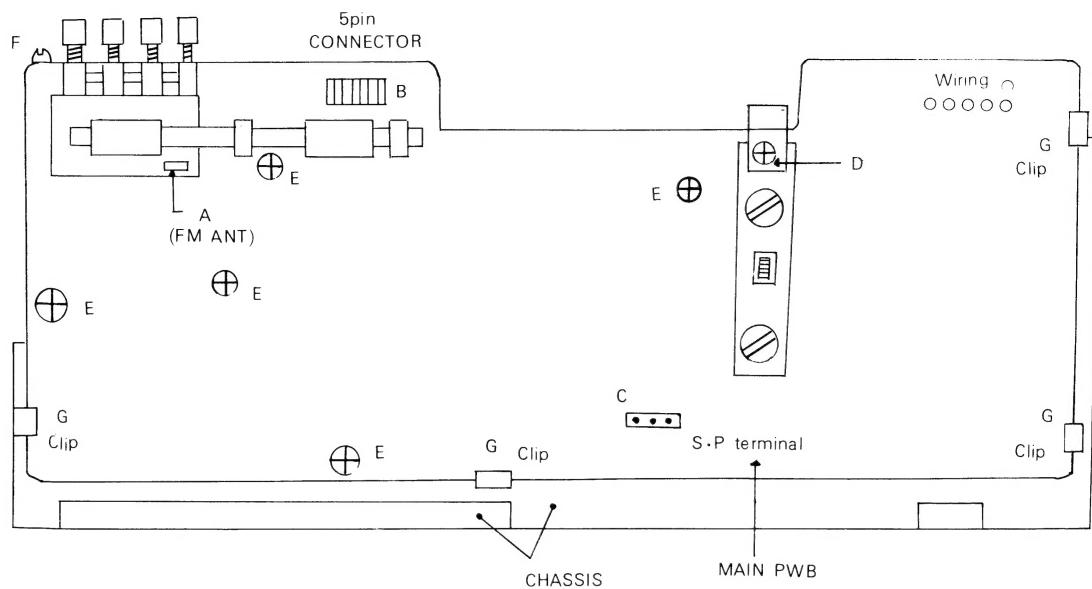


Fig. 5

1. Remove seven screws holding the rear case. (Refer to Exploded View)
2. Pull out a FM ANT terminal (A) in the PWB and separate the chassis from the front CASE.
3. Pull out the connector (5 pin) (B) and separate the wiring (1~6) from the terminal.
4. Pull out the S.P. terminal (4 pin) (C).
5. Pull out the volume knob, tone knob, balance knob and tuning knob.
6. Lift out all parts of chassis that PWB is fixed.
7. Remove a screw (D) holding lever that operating function switch.
8. Remove five screws (E) fixing the PWB and a screw (F) fixing the switch bracket.
9. Separate the PWB from the chassis with four clips (G) holding the PWB.

DIAL CORD STRINGING

Referring to Fig. 6, loop the dial cord in the direction of arrows.
V.C. position: Fully counter clockwise (Low freq. end)

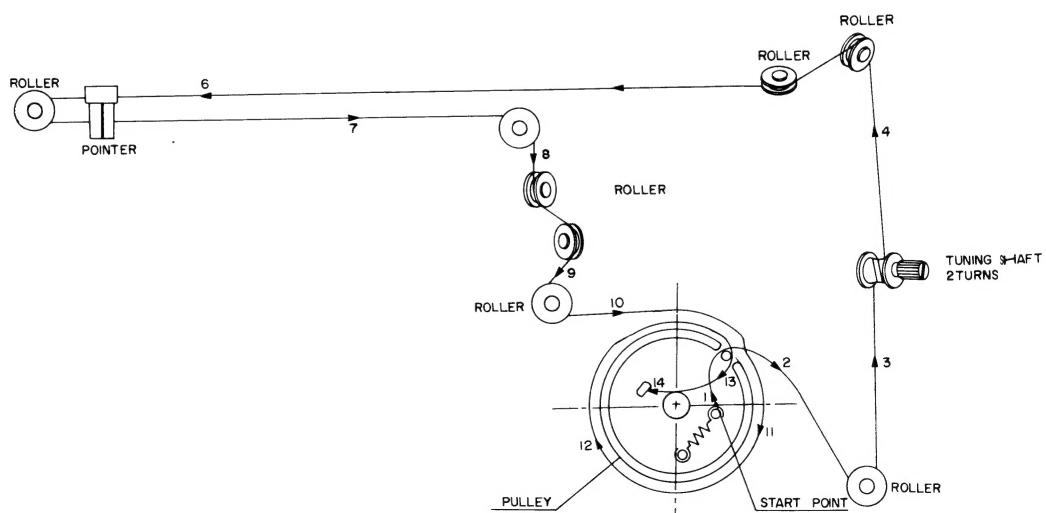


Fig. 6

ALIGNMENT INSTRUCTIONS

INSTRUMENT REQUIRED

- * **Signal Sources**
 1. AM Signal Generator
 2. FM Signal Generator
 3. IF Sweep Generator (for FM)
 4. IF Sweep Generator (for AM)
 5. Dummy Antenna (for FM)
 6. Loop Antenna (for AM)

* Output Indicators

1. VTVM
2. Oscilloscope
3. Frequency Counter

GENERAL PREPARATION

1. Turn on the switch and check the voltage.
2. Set the Function switch to band being aligned.
3. Standard modulation is 400Hz at 30% amplitude for MW, LW, SW, 400Hz at 22.4kHz (75kHz) deviation for FM.
4. FM input impedance is 75 ohm (300 ohm)

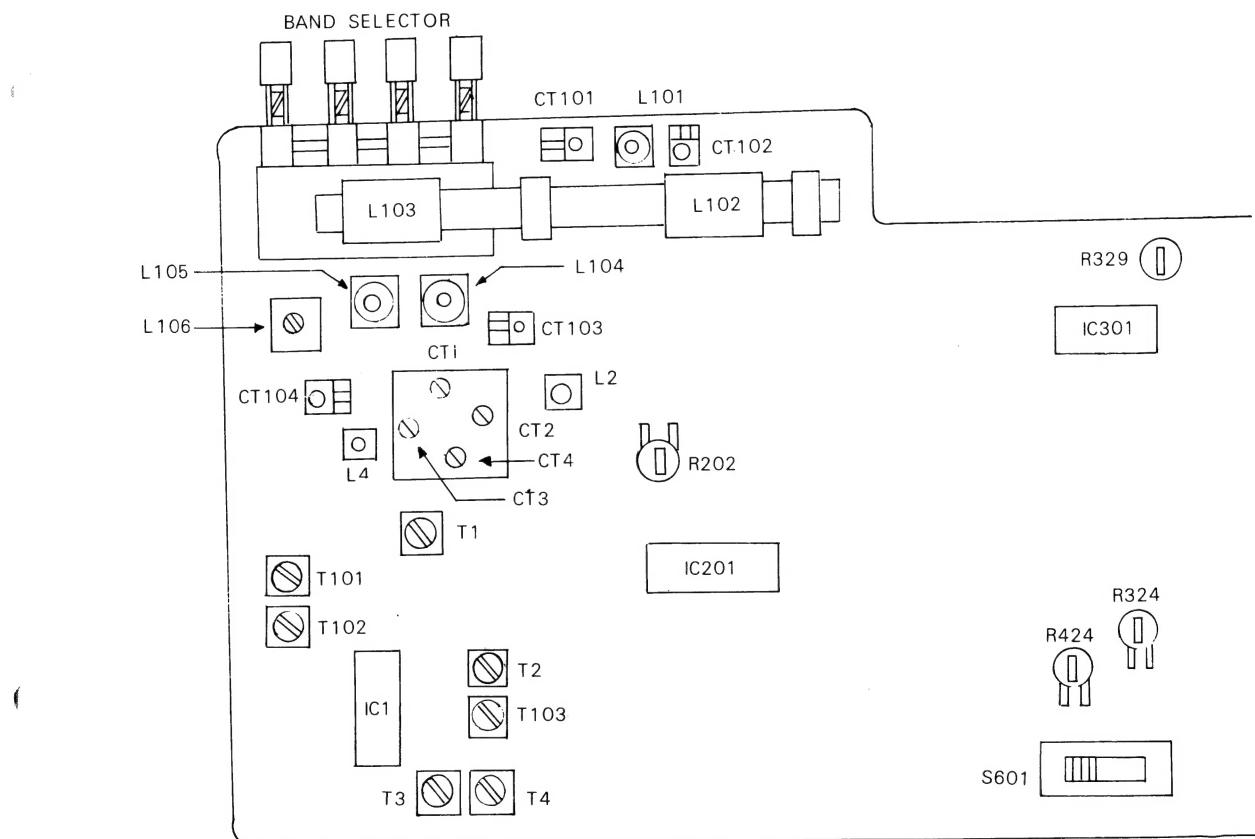


Fig. 7

1. RADIO SECTION

AM (LW, MW, SW, SW1, SW2) – IF Alignment

Sweep Generator Connect the input terminal of sweep generator to the test point C, and the output terminal to L102 (or L103).

Step	Dial Pointer Setting	Sweep Gen. Output	Adjustment for MAX. output
1	High freq. end	465 kHz	T101, T102, T103
2	Repeat step 1		

LW (SW₁) – RF Alignment

Signal Generator Couple the output terminal to L102 (or L103) thru a loop antenna.
Adjust as indicated for maximum reading on V.T.V.M.

Step	Dial Pointer Setting	Sig. Gen. Output	Adjustment for Max. output	
1	Low freq. end	150kHz (2.2MHz)	LW: L106	SW ₁ : L105
2	High freq. end	350kHz (7.3MHz)	LW: CT104	SW ₁ : CT4
3	Repeat steps 1 and 2			
4	160kHz (2.7MHz) Signal		LW: L103	SW ₁ : L102
5	330kHz (6.3MHz) Signal		LW: CT102	SW ₁ : CT3
6	Repeat steps 4 and 5			

MW-RF Alignment

Signal Generator Couple the output terminal same as LW (SW₁)RF Alignment.
Adjust as indicated for maximum reading on V.T.V.M.

Step	Dial Pointer Setting	Sig. Gen. Output	Adjustment for Max. Output	
1	Low freq. end	515kHz	TSR-590: L105	TSR-595: L106
2	High freq. end	1650kHz	" : CT4	" : CT104
3	Repeat steps 1 and 2			
4	600kHz Signal		TSR-590: L102	TSR-595: L103
5	1400kHz Signal		" : CT3	" : CT102
6	Repeat steps 4 and 5			

SW (SW₂) – RF Alignment

Signal Generator Connect to telescopic antenna terminal using a dummy ant.
V.T.V.M. Connect AC probe to speaker terminals.
Adjust as indicated for maximum reading on V.T.V.M.

Step	Dial Pointer Setting	Sig. Gen. Output	Adjustment for Max. Output
1	Low freq. end	5.8MHz (6.8MHz)	SW, SW ₂ : L104
2	High freq. end	18MHz (22.3MHz)	" : CT103
3	Repeat steps 1 and 2		
4	6.5MHz (8MHz) Signal		SW, SW ₂ : L101
5	16MHz (20MHz) Signal		" : CT101
6	Repeat steps 4 and 5		

F/M-IF Alignment

Oscilloscope Connect VERT. terminal of oscilloscope to Test Point (D) (R21).
Sweep Generator Connect to test point (B) (L3).
Adjust as indicated until the maximum wave form as shown in Fig. 8 is obtained.

Step	Dial Pointer Setting	Gen. output	Adjustment for Max. output
1	High freq. end	10.7 MHz Sweep	Detune T4 and then adjust T1, T2 and T3
2	Repeat step 1		

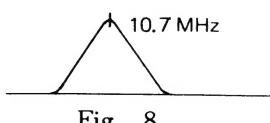


Fig. 8

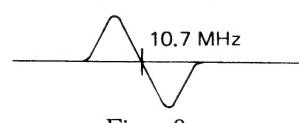


Fig. 9

FM-DISC. Alignment

Oscilloscope, Sweep Generator connect same as FM-IF Alignment.

Adjust as indicated until the maximum waveform ("S" curve) as shown in Fig. 9 is obtained.

Step	Dial Pointer Setting	Gen. output	Adjustment for Max. output
1	High freq. end	10.7MHz Sweep	"S" curve is obtained with T4 and maximum waveform is obtained with T3.
2	Repeat step 1		

FM-RF Alignment

Signal Generator Connect to telescopic antenna terminal using a dummy ant.

V.T.V.M. Connect AC probe to speaker terminals.

Adjust as indicated for maximum reading on V.T.V.M.

Step	Dial Pointer Setting	Sig. Gen. output	Adjustment for Max. output
1	Low freq. end	87.5MHz	TSR-590, 595: L4
2	High freq. end	109 MHz	" : CT1
3	Repeat steps 1 and 2		
4	90MHz Signal	90MHz	TSR-590, 595: L2
5	106MHz Signal	106MHz	" : CT2
6	Repeat steps 4 and 5		

FM-Multiplex & Tuning Meter Level Alignment

*1: Adjust R202 (5KΩB) so that STEREO LAMP is the most lighted.

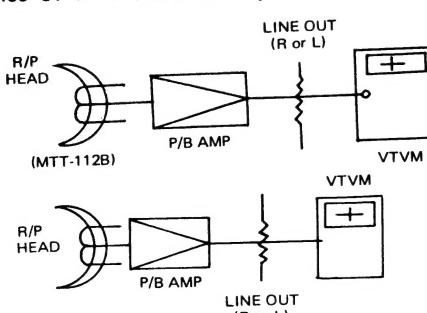
*2: Adjust T2 so that the indication of Meter may be meter scale 8~10.

Item	SSG,	INPUT Connection	VTVM or Oscilloscope	Adjust	Remark
STEREO SEPARATION	<ul style="list-style-type: none"> FM SSG STEREO Modulator a) 98MHz, 60dB b) L (or R) 45% c) Pilot 10% 	FM ANT	LINE OUT or SPEAKER TERMINAL	R202 5KΩB	*1
TUNING METER LEVEL	<ul style="list-style-type: none"> FM SSG 98MHz, 100dB 30% MOD. 	FM ANT	-	T2	*2

2. TAPE RECORDER SECTION

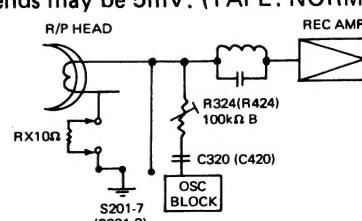
R & L P/B LEVEL

* Using TEST TAPE (MTT-112B), adjust R329 (1KΩB) so that output level difference of R Ch. and L may be within 1.5dB.



BIAS CURRENT

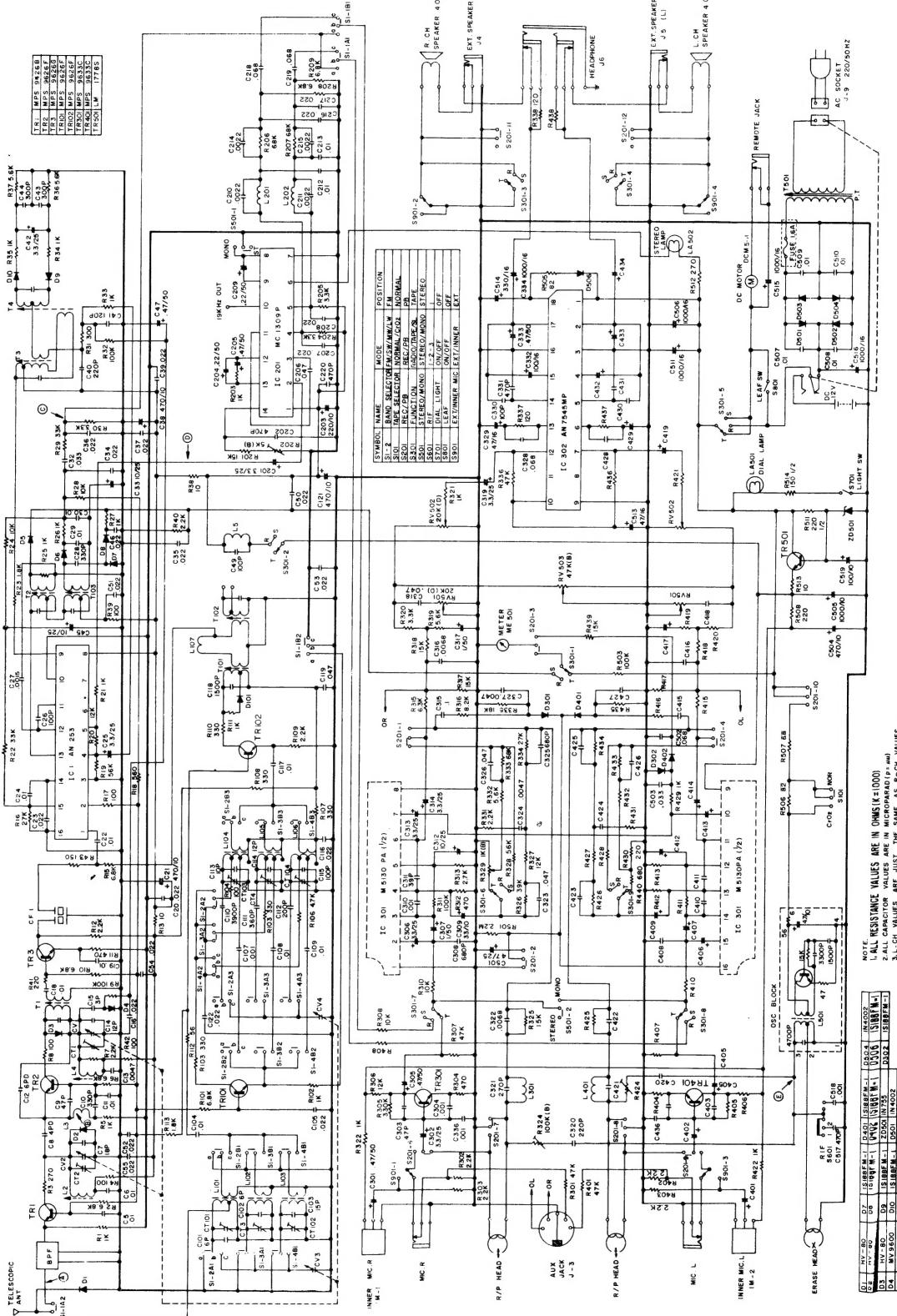
* In recording position (no signal), connect RX(10Ω) as shown in Fig. and adjust R324 (R424) so that voltage of it both ends may be 5mV. (TAPE: NORMAL)



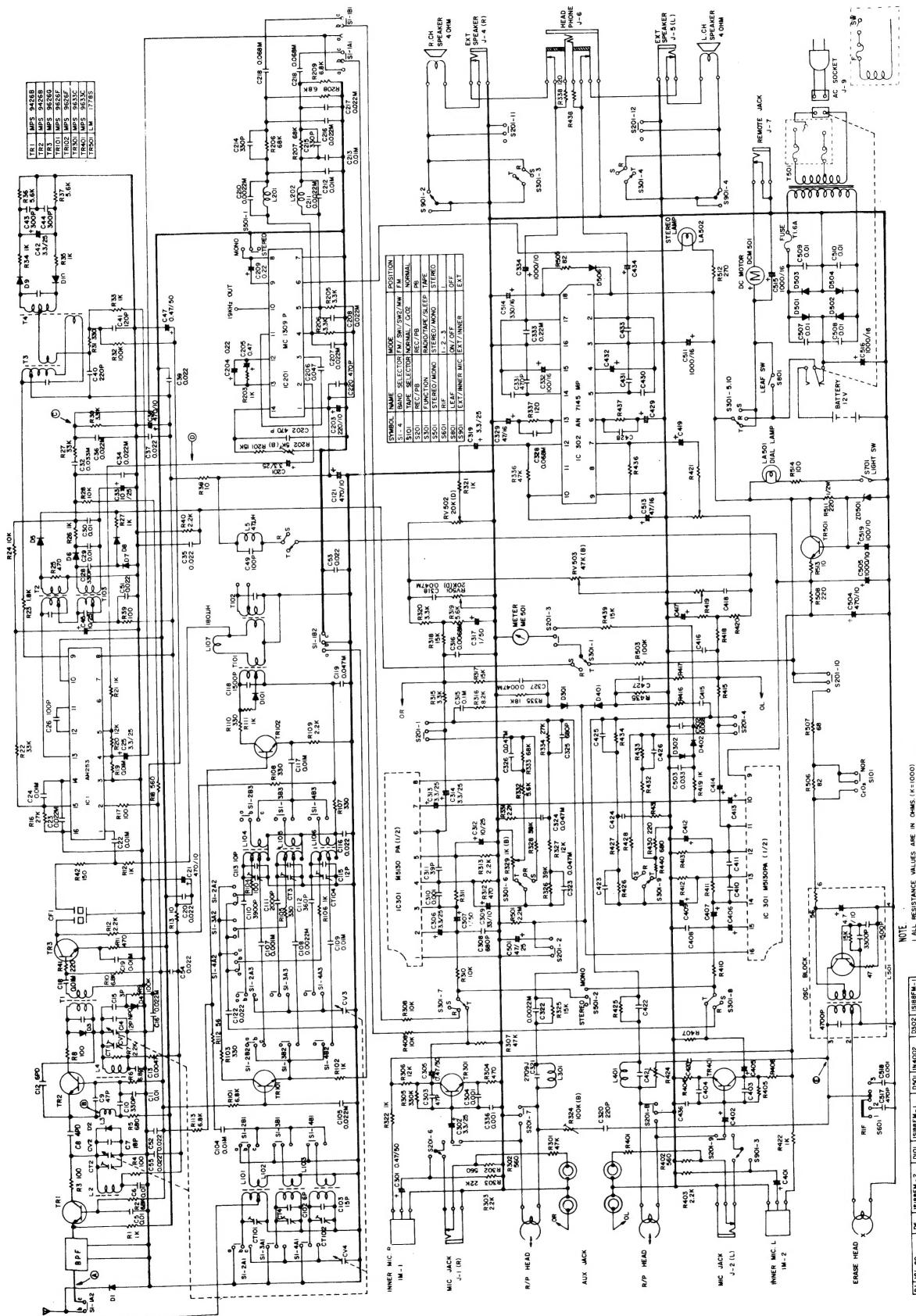
AZIMUTH

* Using TEST TAPE (MTT-114), adjust azimuth adjustment screw so that output level of R Ch. and L may be the same value. (MODE: MONO)

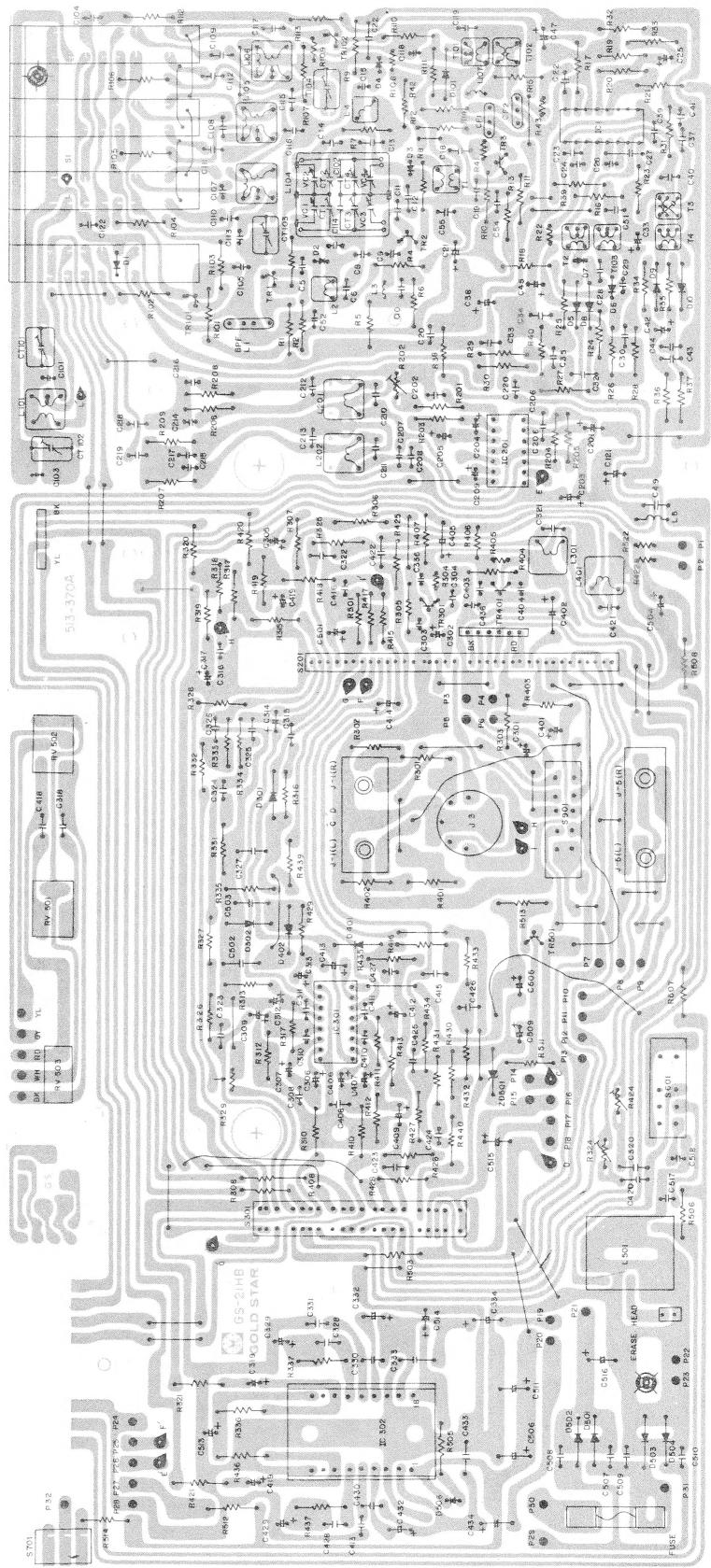
SCHEMATIC DIAGRAM(TSR-590 :FM/SW/MW/LW)



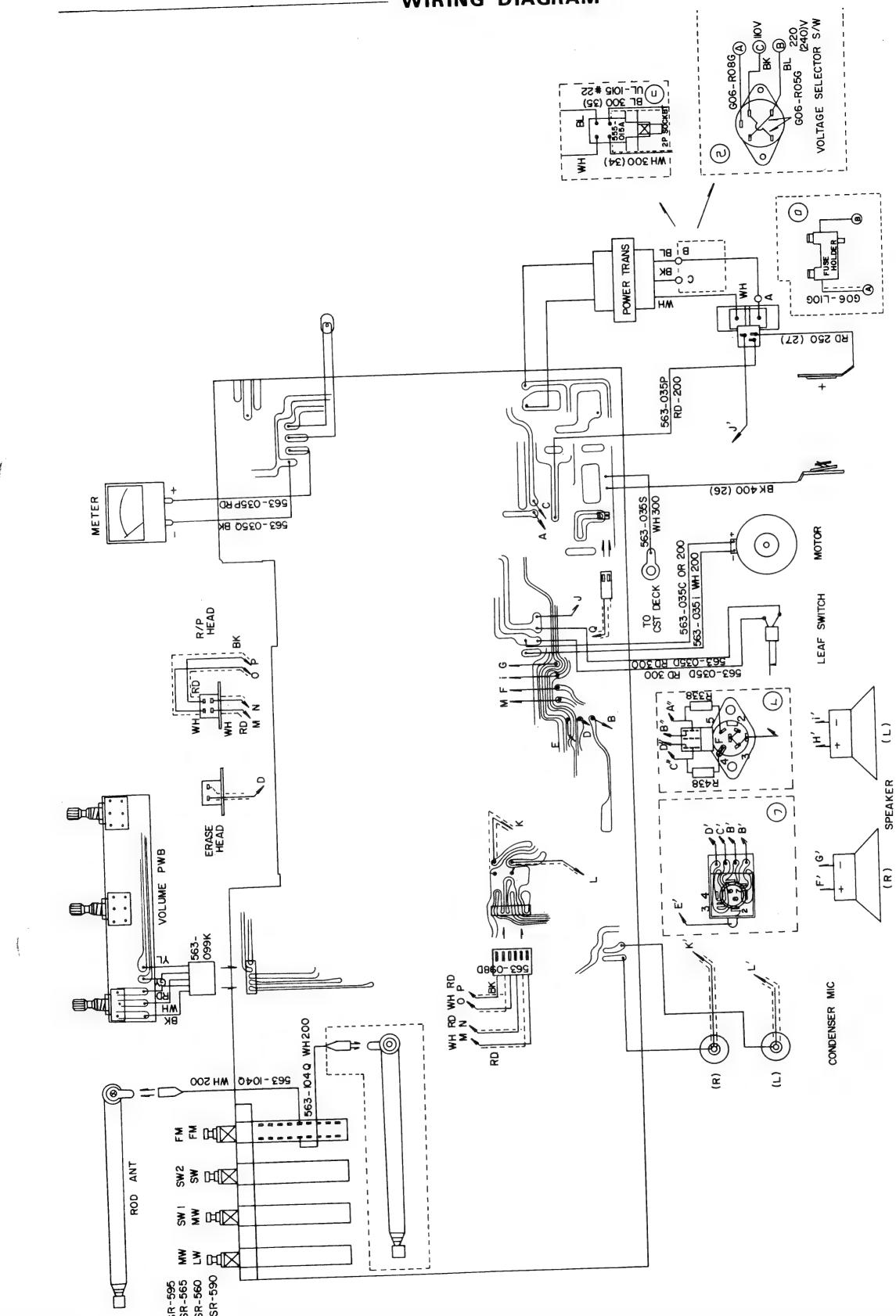
SCHEMATIC DIAGRAM(TSR-595 : FM/SW₂/SW₁/MW)



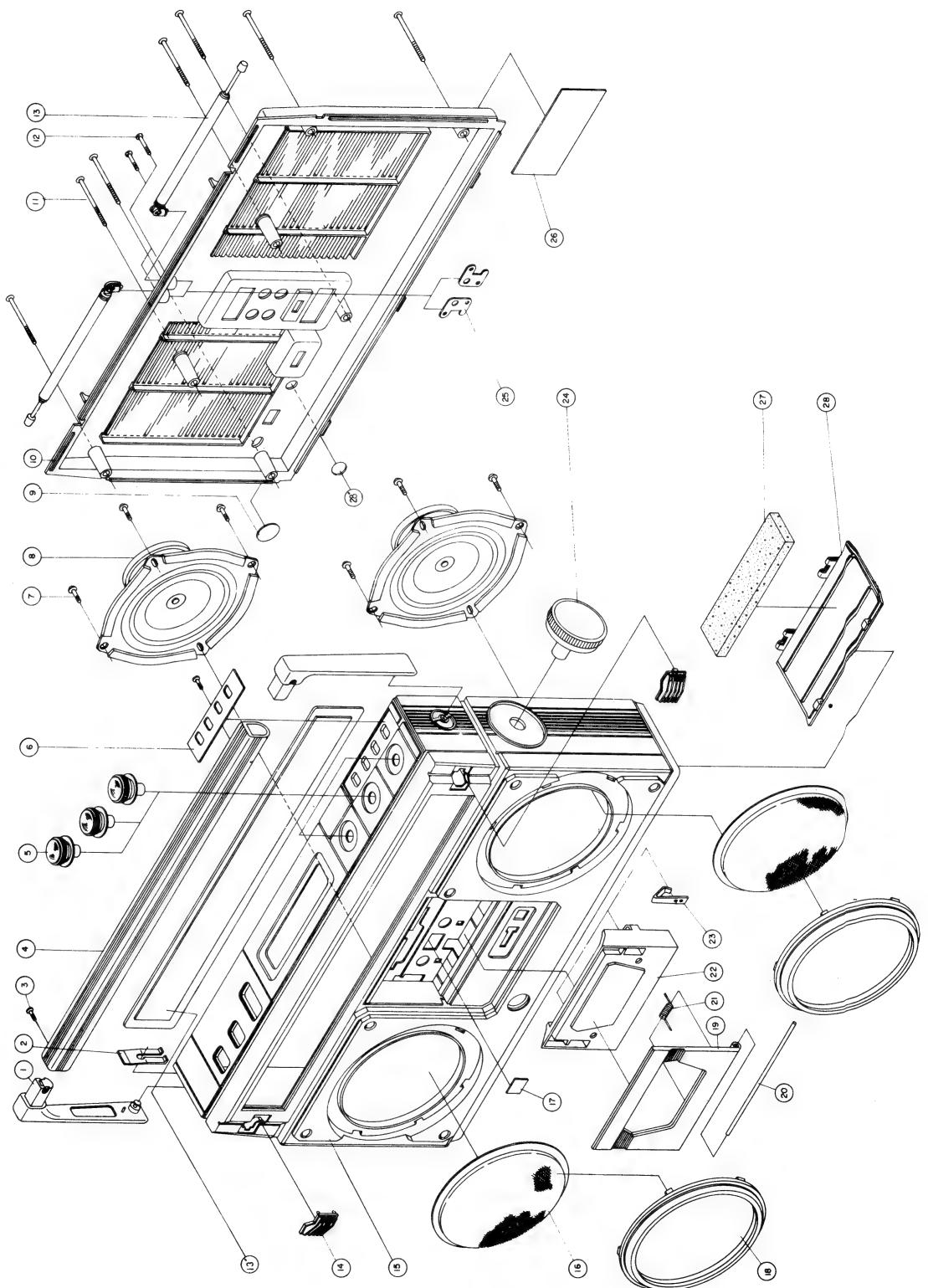
- PWB ASSEMBLY



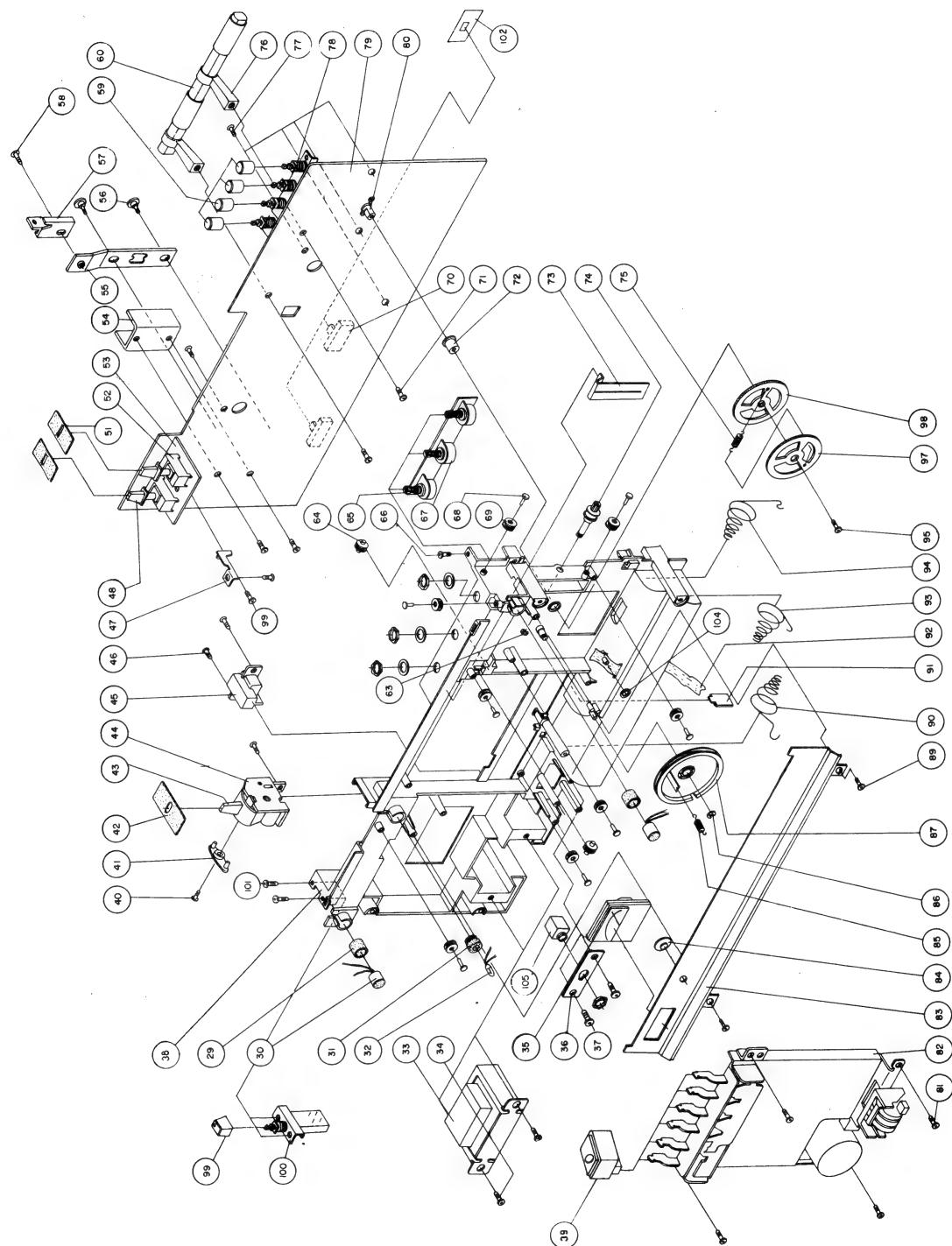
WIRING DIAGRAM



- EXPLODED VIEW A



EXPLODED VIEW B



REPLACEMENT PARTS LIST

1. MECHANICAL PART

NO.	PART NO.	DESCRIPTION	NO.	PART NO.	DESCRIPTION
1	324N348A	Holder Handle	51	221N378D	Cover Switch B
2	334N014B	Stopper Handle	52	556N025A	Switch Toggle
3	MAC1830L	Screw MAC + 3 x 6	53	513N361A	PWB Switch
4	261N075B	Handle	54	255N045A	Plate Heat-Sink
5	272N073B	Knob Ay Volume	55	333N112A	Lever Switch A
6	251N157A	Band Plate	56	353N051A	Screw Special
7	353-052φ	Screw Special	57	333N113A	Lever Switch B
8	541N101D	Speaker	58	MPC1830J	Screw MPC + 3 x 6
9	256N282A	Plate Socket	59	275N075B	Button Band
10	217N225B	Case Rear	60	632N041A	Coil Antenna Ay
11	353N041C	Screw Special	63	354N008D	Washer E-Ring
12	MAC1843L	Screw MAC + 3 x 14	65	611N053K	Volume Balance
13	532N035B	Antenna Rod	66	353-027J	Screw MPC + 3 x 6
13'	236N125A	Window	67	611N072D	Volume Tone
14	276N027A	Mic Cap	68	423N254A	Shaft Roller
15	217N226A	Front Case	69	434N031A	Roller
16	365N067A	Speaker Metal	70	552N009D	Slide S/W
17	256N122B	Plate Refraction	71	TRQ1841J	Screw TRQ2 + 3 x 12A
18	224N030A	Speaker Grill	72	423N256A	Shaft Connecting
19	221N381B	Cover Cassette	73	361N122B	Pointer
20	423N070A	Shaft	74	421N275A	Shaft Tuning
21	442N146A	Spring	75	442N212A	Spring
22	217N219A	Case Cassette	76	324N374A	Holder Antenna
23	442N207A	Spring	77	553N025F	Screw Special
24	271N154B	Knob Tuning	78	554N020P	Switch Unipush
25	251N159A	Lug Antenna	79	513N370A	PWB Main
26	243N313C	Label	80	622N034A	Varicon Poly
27	447N012H	Cushion	81	TRQ1836J	Screw TRQ2 + 3 x 8A
28	221N357A	Cover Battery	82	412-024B	Deck Ay Cassette
29	221N389A	Hole Cover	83	252N193D	Plate Scale
30	542N017D	Condenser MIC	84	519N002A	Indicator Disc
31	324N273A	Holder Lamp	85	442N004E	Dial Cord Spring
32	ABA=125F	Lamp Pilot	86	354N008D	Washer E-Ring
33	641N085C	Trans Power	87	433N029A	Wheel
34	TRQ1839J	Screw TRQ2 + 3 x 10A	89	TRQ1830J	Screw TRQ2 + 3 x 6A
35	518N032D	Meter/Level/Tuning/Battery	90	442N138C	Spring Battery
36	321N318A	Phone Bracket	91	563N028A	Terminal (+)
37	TRQ1836J	Screw TRQ2 + 3 x 8A	92	455N004E	Ribbon Battery
38	313N139A	Chassis	93	442N192A	Spring Battery
39	275N078A	Button	94	442N193A	Spring Battery
40	353N018A	Screw Special	95	MPC1841J	Screw MPC2 + 3 x 12
41	333N114A	Lever See-Saw	97	435N011A	Gear B
42	221N378C	Cover Switch A	98	435N009A	Gear A
43	333N116B	Lever Toggle B	99	275N062B	Button Power
44	324N347A	Holder Lever	100	221N141A	Cover Switch
45	573N045A	Socket 2P	101	MPC1836J	Screw MPC 3 x 8
46	TRQ1839J	Screw TRQ2 + 3 x 10A			
47	321N275A	Bracket PWB			
48	333N115B	Lever Toggle A			

2. ELECTRICAL PART

This electrical parts list is used in common for our Model TSR-590 and TSR-595 except appendix I, II.

NO.	SYMBOL NO.	PART NO.	DESCRIPTION
1	F-1	513N370A	PWB Main
2	CV1-4 CT1-4	622N034A	Varicon Poly P2-22PF 10H
3	S1-1-1-4	554N020P	Switch Uni Push
4	TR1, 2	662N031C	Transistor Motorola MPS9426C
5	TR102, 101	662N048C	" " MPS9626F
6	TR3	662N048D	" " MPS9626G
7	TR301, 401	662N026C	" " MPS9633C
8	TR501	662N020A	" " MPS9418S
9	IC1	668N005A	IC AN 253BB (IF)
10	IC201	668N043A	IC MC1309P (MPX)
11	IC301	668N041A	IC M5130PA (EQ)
12	IC302	668N042A	IC AN7145MP (Audio)
13	S201-1-12	552N022A	Switch Slide
14	S3-1-1-10	552N014A	Switch Slide
15	D1, 2, 3	651-004A	Diode Detect HV-80
16	D4	654N401A	Diode A.F.C MV9600
17	D5, 7, 8, 9, 10	651N001D	Diode Detect IS188FM-1
18	D6	651N020A	Diode IS188FM-2
19	D101	651N001D	Diode Detect IS188FM-1
20	D301, 302, 401, 402, 506	651N001D	Diode Detect IS188FM-1
21	ZD501	654N218A	Diode Zener IN755A
22	D501, 502	652-005B	Diode Rectifier IN4002
23	D503, 504	652-005B	Diode Rectifier IN4002
24	L1	616N016A	Filter Band PASS PFWB2
25	L2	635N013B	Coil RF FM
26	L3	635N006A	Coil RF FM
27	L4	635N013A	Coil RF FM
28	L5	639N003K	Coil Choke
29	L101	634N029A	Coil Oscillator SW
30	L104	634N029B	Coil SW (OSC)
31	L107	639N003L	Coil Peaking
32	L201, 202	638N003A	Coil Trap
33	L301, 401	638N003A	Coil Trap
34	L501	634N030A	Coil Oscillator Block
35	T1	644N018D	Trans IF FM
36	T2	644N018H	Trans IF FM
37	T3	647N008C	Discriminator FM
38	T4	647N008D	Discriminator FM
39	T101	644N019D	Trans IF

NO.	SYMBOL NO.	PART NO.	DESCRIPTION
40	T102	644N019G	Trans IF MW
41	T103	644N019E	Trans IF MW
42	CT101, 102, 103, 104	623N012A	Trimmer
43	CF1	616N004C	Filter Ceramic SFE-107 MA8 RD
44	C5, 6, 11, 29, 30	CK103Z02	C. Ceramic CK 0.01MF-Z 50V
45	C8	CC040D06	" 4PF-D CH 50V
46	C9	CC470K01	" 47PF-K SL 50V
47	C10, 28	CC331K01	" 330PF-K SL 50V
48	C18, 19, 22, 24	CQ103M01	C. Polyester 0.01MF-M 50V
49	C21, 38	CE477B01	C. Electrolytic 470MF 10V
50	C37, 29, 55, 52	CQ223M01	C. Polyester 0.022MF-M 50V
51	C14, 7	CC120J06	C. Ceramic 12PF-J CH 50V
52	C15	CC030D01	" 3PF-D SL 50V
53	C16, 23, 34, 53, 20, 56	CQ223M01	" 0.022MF-M 50V
54	C25, 42	CE335F01	C. Electrolytic 3.3MF 50V
55	C26, 49	CC101K01	C. Ceramic 100PF-K SL 50V
56	C33, 45	CK223Z03	C. Electrolytic 10MF 35V
57	C20, 35, 51, 54	CK223Z03	C. Ceramic 0.022MF-K SL 50V
58	C40	CC221K01	" 220PF-K SL 50V
59	C41	CC121K01	" 120PF-K SL 50V
60	C43, 44	CC301K01	" 300PF-K SL 50V
61	C47	CE474F01	C. Electrolytic 0.47MF 50V
62	C102	CC060D01	C. Ceramic 6PF-D SL 50V
63	C107	CQ102M01	C. Polyester 0.001MF-M 50V
64	C110	CY392J01	C. Polystyrol 3900PF-JR
65	C114	CC120K01	C. Ceramic 12PF-K SL50V
66	C115	CC101J01	" 100PF-J SL 50V
67	C105, 116	CQ223M01	C. Polyester 0.022MF-M 50V
68	C104, 109, 117	CQ103 M01	C. Polyester 0.01MF-M50V
69	C118	CY152J01	C. Polystyrol 1500PF-JR
70	C119	CQ472M01	C. Polyester 0.047MF-M 50V
71	C121	CE477B01	C. Electrolytic 470MF-10V
72	C122	CK223Z02	C. Ceramic 0.022MF-Z50V
73	C220	CC471K01	" 470MF-K SL 50V
74	C201	CE335F01	C. Electrolytic 3.3MF 50V
75	C202	CY471J01	C. Polystyrol 470MF-JR
76	C203	CE227B01	C. Electrolytic 220MF 10V
77	C204, 209	CE224F01	" 0.22MF 50V
78	C205	CE474F01	" 0.47MF 50V
79	C206	CQ473M01	C. Polyester 0.047MF-M 50V
80	C207, 208, 216, 217	CQ223M01	" 0.022MF-M 50V
81	C210, 211	CQ222M01	" 0.0022MF-M 50V
82	C212, 213	CQ103M01	" 0.01MF-M 50V

NO.	SYMBOL NO.	PART NO.	DESCRIPTION
83	C214, 215	CQ222M01	" 0.0022MF-M 50V
84	C218, 219	CQ683M01	" 0.068MF-M 50V
85	C301, 401	CE474F01	C. Electrolytic 0.47MF 50V
86	C302, 402, 306, 406	CE335F01	" 3.3MF 50V
87	C303, 403	CC470K01	C. Ceramic 47PF-K SL 50V
88	C404, 304, 310, 410	CK102Z02	" 0.001MF-Z 50V
89	C305, 405	CE474F01	C. Electrolytic 0.47MF 50V
90	C307, 407	CE105F01	" 1MF 50V
91	C308, 408, 325, 425	CC681K01	C. Ceramic 680PF-K SL 50V
92	C309, 410	CE336B01	C. Electrolytic 33MF 10V
93	C311, 411	CC390K01	C. Ceramic 39PF-K SL 50V
94	C312, 412	CE106E01	C. Electrolytic 10MF 35V
95	C313, 413, 314, 414	CE335F01	" 3.3MF 50V
96	C315, 415	CQ104M01	C. Polyester 0.1MF-M 50V
97	C316, 416	CQ682M01	" 0.0068MF-M 50V
98	C317, 417	CE105F01	C. Electrolytic 1MF 50V
99	C319, 419	CE335F01	" 3.3MF 50V
100	C320, 420	CC221K01	C. Ceramic 220MF-K SL 50V
101	C321, 421	CC371J01	" 270PF-J SL 50V
102	C323, 423, 326, 426	CQ473M01	C. Polyester 0.047MF-M 50V
103	C324, 424, 327, 427	CQ472M01	" 0.0047MF-M 50V
104	C328, 428	CQ683M01	" 0.068MF-M 50V
105	C329, 429	CE476C01	C. Electrolytic 47MF 16V
106	C330, 430	CC101K01	C. Ceramic 100PF-K SL 50V
107	C331, 431, 517	CC471K01	" 470PF-K SL 50V
108	C332, 432	CE107C01	C. Electrolytic 100MF 16V
109	C334, 434	CE108C01	" 1000MF 16V
110	C501	CE475F01	" 4.7MF 50V
111	C502	CQ683M01	C. Polyester 0.068MF-M 50V
112	C504	CE477B01	C. Electrolytic 470MF 10V
113	C505	CE108B01	" 1000MF 10V
114	C506, 511, 515, 516	CE108C01	" 1000MF 16V
115	C507, 508, 509, 510	CK103Z02	C. Ceramic 0.01MF-Z 50V
116	C513	CE476C01	C. Electrolytic 47MF 16V
117	C514	CE335C01	" 330MF 16V
118	C518	CK102Z02	C. Ceramic 0.001MF-Z 50V
119	C519	CE107B01	C. Electrolytic 100MF 10V
120	C322, 422	CQ223M01	C. Polyester 0.0022MF-M 50V
121	C27	CQ152M01	C. Polyester 0.0015MF-M 50V
122	C335, 436	CQ102M01	" 0.001MF-M 50V
123	C12	CC060D06	C. Ceramic 6PF-D CH 50V
124	C32, 503	CO333M01	C. Polyester 0.033MF-M 50V
125	C318 418	CQ473M01	" 0.047MF-M 50V

NO.	SYMBOL NO.	PART NO.	DESCRIPTION
126	C13	CK472Z02	C. Ceramic 0.0047MF-Z 50V
127	R2, 6, 10	RD682K09	R. Carbon 6.8K-K 1/4WM
128	R11	RD471K09	" 470 ohm-K 1/4WM
129	R4, 8, 17, 39, 42	RD101K09	" 100 ohm-K 1/4WM
130	R1, 14, 15, 21, 25, 26, 27	RD102K09	" 1K-K 1/4WM
131	R7, 12, 40	RD222K09	" 2.2K-K 1/4WM
132	R9, 32	RD104K09	" 100K-K 1/4WM
133	R13, 38, 513	RD100K09	" 10 ohm-K 1/4WM
134	R16	RD273K09	" 27K-K 1/4WM
135	R18	RD561K09	" 560 ohm-K 1/4WM
136	R20	RD123K09	" 12K-K 1/4WM
137	R29	RD333K09	" 33K-K 1/4WM
138	R24, 28	RD103K09	" 10K-K 1/4WM
139	R36, 37, 19	RD562K09	" 56K-K 1/4WM
140	R108	RD331K02	" 330 ohm-K 1/4WM
141	R33, 34, 35	RD102K09	" 1K-K 1/4WM
142	R104	RD101K09	" 100 ohm-K 1/4WM
143	R101, 113	RD582K09	" 6.8K-K 1/4WM
144	R102, 111, 105	RD102K09	" 1K-K 1/4WM
145	R103, 107, 110, 31, 105	RD331K09	" 330 ohm-K 1/4WM
146	R109	RD222K02	" 2.2K-K 1/4WR
147	R112	RD560K09	" 56 ohm-K 1/4WM
148	R106	RD472K09	" 4.7K-K 1/4WM
149	R201	RD153K09	" 15K-K 1/4WM
150	R203	RD102K09	" 1K-K 1/4WM
151	R30, 204, 205	RD332K09	" 3.3K-K 1/4WM
152	R206, 207	RD683K09	" 68K-K 1/4WM
153	R208, 209	RD682K09	" 6.8K-K 1/4WM
154	R202	613-003G	VR Semi Fixed TR11R-5KB
155	R301, 401, 407, 307	RD473K09	R. Carbon 47K-K 1/4WM
156	R406	RD123K02	" 12K-K 1/4WM
157	R302, 402	RD222K09	" 2.2K-K 1/4WM
158	R303, 403	RD222K09	" 2.2K-K 1/4WM
159	R304	RD471K02	" 470 ohm-K 1/4WM
160	R404, 312, 412	RD471K09	" 470 ohm-K 1/4WM
161	R305, 405	RD334K02	" 330K-K 1/4WM
162	R308, 408, 310, 410	RD103K09	" 10K-K 1/4WM
163	R311, 411	RD104K09	" 100K-K 1/4WM
164	R313	RD272K09	" 2.7K-K 1/4WM
165	R413	RD272K09	" 2.7K-K 1/4WM
166	R315, 415, 320, 420	RD332K09	" 3.3K 1/4WM
167	R317, 417, 318, 418, 325, 425, 439	RD153K09	" 1.5K-K 1/4WM
168	R319, 419, 335, 435	RD562K09	" 5.6K-K 1/4WM
169	R321, 421, 429	RD102K09	" 1K-K 1/4WM

NO.	SYMBOL NO.	PART NO.	DESCRIPTION
170	R322, 422	RD102K02	" 1K-K 1/4WR
171	R334, 434	RD273K09	" 27K-K 1/4WM
172	R326, 426, 328, 428	RD393K09	" 39K-K 1/4WM
173	R327, 427, 306	RD123K09	" 12K-K 1/4WM
174	R512	RD271K09	" 270 ohm-K 1/4WM
175	R440	RD681K09	" 680 ohm-K 1/4WM
176	R331, 431	RD222K09	" 2.2K-K 1/4WM
177	R332, 432	RD562K09	" 5.6K-K 1/4WM
178	R333, 433	RD683K09	" 68K-K 1/4WM
179	R336, 436	RD473K09	" 47K-K 1/4WM
180	R337, 437	RD121K09	" 120 ohm-K 1/4WM
181	R338, 438	RD121K02	" 120 ohm-K 1/4WM
182	R324, 424	613N003C	VR SEMI-Fixed TRUR-100KB 2P
183	R329	613N002A	" SR19R-1KB 10D
184	R501	RD225K09	R. Carbon 2.2K-K 1/4WM
185	R503	RD124K09	" 120K-K 1/4WM
186	R507	RD680K09	" 68 ohm-K 1/4WM
187	R505, 506	RD820K09	" 82 ohm-K 1/4WM
188	R508, 430	RD221K09	" 220 ohm-K 1/4WM
189	R43	RD151K02	" 150 ohm-K 1/4WR
190	R511	RD221K03	" 220 ohm-K 1/4WP
191	R41	RD221K02	" 220 ohm-K 1/4WR
192	R3	RD271K09	" 270 ohm-K 1/4WM
193	R23	RD182K09	" 1.8K-K 1/4WM
194	R5	RD681K09	" 680 ohm-K 1/4WM
195	R514	RD151K03	" 150 ohm-K 1/4WP
196	R22	RD333K02	" 33K-K 1/4WR
197	P	281N254B	Packing Ay

Appendix I : TSR-590

Appendix II : TSR-595

NO.	SYMBOL NO.	PART NO.	DESCRIPTION	NO.	SYMBOL NO.	PART NO.	DESCRIPTION
1	L102, 103	632N041A	Coil Antenna Ay (MW/LW)	1	L102, 103	632N040C	Coil Antenna Ay (MW/SW)
2	L105	634N001P	Coil OSC MW	2	L105	634N001Q	Coil OSC SW
3	L106	634N018G	Coil OSC LW	3	L106	634N001P	Coil OSC MW
4	C101	CC060D01	C, Ceramic 6pF SL 50V	4	C108	CQ222M01	C, polyester 0.0022 μ F 50V
5	C103	CC150J01	C, Ceramic 15pF J 50V	5	C111	CY202J01	C, polystyrol 2000PF JR
6	C108	CQ103M01	C, polyester 0.01 μ F 50V	6	C112	CY361J01	C, polystyrol 360PF JR
7	C111	CY361J01	C, polystyrol 360PF JR				
8	C112	CY201J01	C, polystyrol 200PF JR				
9	C113	CC100D01	C, Ceramic 10PF SL 50V				